THE BOYD BRICK PRESS

CHICAGO

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Historical

IN 1888 the first Boyd Brick Press was introduced to the brickmakers of the United States and the world. Its advent marked the beginning of rapid improvement in the building of brick machines, as well as the brickmaking industry.

The first Boyd Brick Press was designed with the idea that it could not be too well built, and while it did not realize our ideal of perfection, its combined principles of construction, design and operation proved so satisfactory by long and constant use that some of its original features are still employed. That the first Boyd Presses, built in 1888-1891, were constructed on the right principles, and for long, hard and constant work, is attested by the fact that most of them are still in use, doing good work.

The Boyd Brick Press is not an imitation; neither is it an untried or experimental machine. It has stood the test of years. It has always been distinguished for its originality in design and construction, strength, endurance and quality of product. It has many distinctive and characteristic features. Like everything of merit, it has been imitated, but the trouble with imitators is they imitate in appearance only, and forget quality of material and workmanship.

By constantly watching the operation of these machines for many years, working various kinds of clays and shales, operating under all conditions, and keeping in close touch with the users of them, many improvements have been suggested and made from time to time. This is responsible in no small degree for the acme of perfection attained in the Boyd Brick Press of to-day, and answers the question of why there are more of them in use than of all other press brick machines combined.

The Boyd Brick Press was the standard at the start and is still the standard by which all other brick presses are judged. Steady progress, merit and improvements have kept it at the front. The Boyd Brick Press as built to-day stands pre-eminent as representing the most advanced development in brick-pressing machines along practical and mechanical lines. It embodies principles and methods in construction that have by long and constant use proven correct, and it is used throughout the entire world.

Equipment and Facilities

THIS is the age of specialism in all lines of manufacture, and our specialty is brick presses and other machinery for the manufacture of brick by the semi-dry clay process. It is not a side line with us; we are the largest exclusive builders of brick presses in the world.

Our manufacturing plant is located at Fifty-seventh and Wallace Streets, Chicago, on the Belt Railroad, which has direct connection with all principal railroads entering the city, thus affording unexcelled shipping facilities by through cars to any part of the country.

Our works are completely equipped with modern and specially constructed machine tools, each one designed to perform some special operation in the building of the Boyd Brick Press.

We employ a system of hardened steel templates and gauges, to which every part of the Boyd Brick Press is accurately made. This insures an absolute fit and enables us to make every part of the same kind exactly alike. Only in a shop with such special appliances can the duplication or standardization of parts be attempted or successfully accomplished.

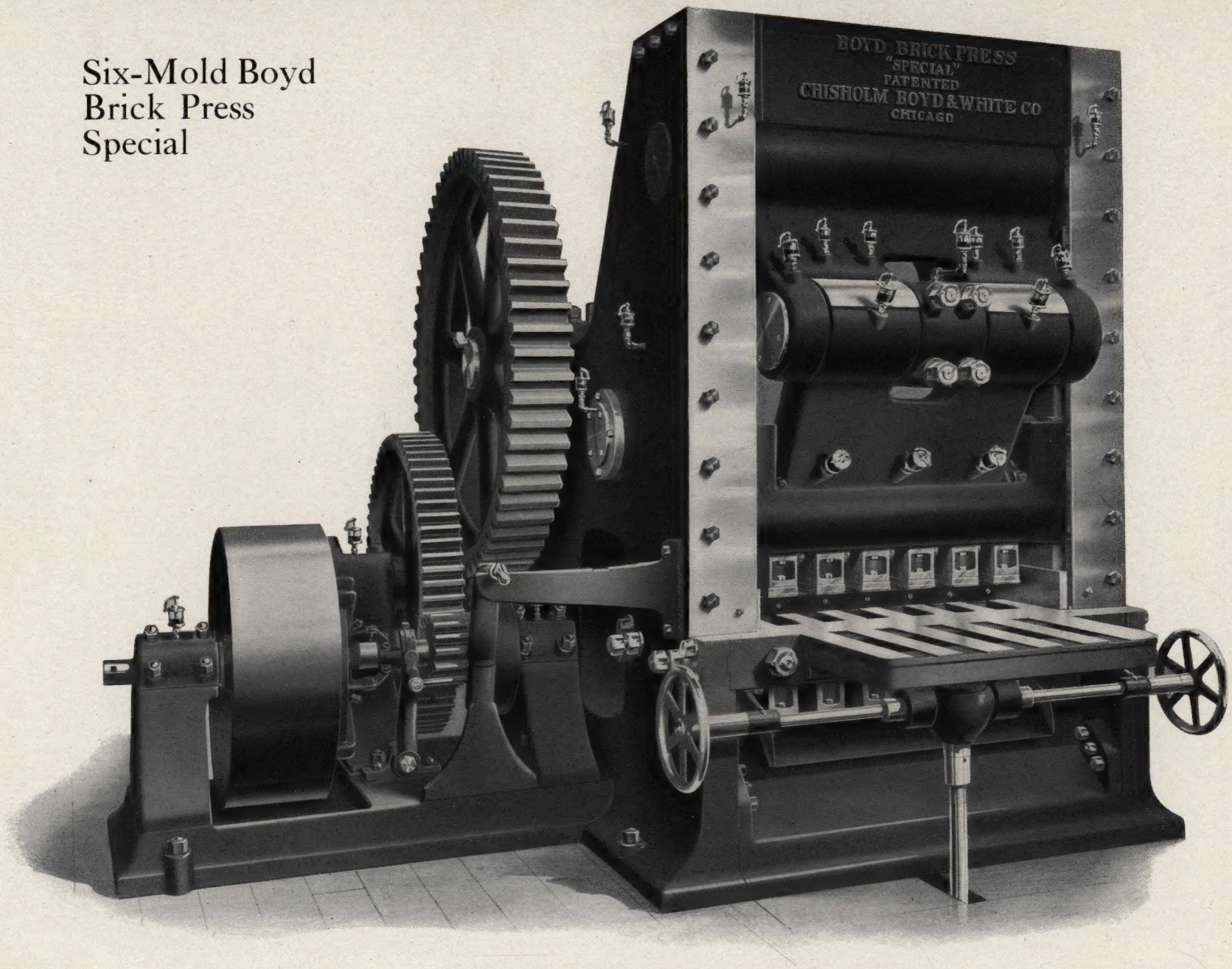
A supply of standard parts is kept constantly in stock ready for immediate shipment. Repair parts, of course, are of no use to a brickmaker until he needs one; then he needs that particular part without delay. It is not necessary to send parts of any Boyd Press to Chicago to have them duplicated, or for renewals. No Boyd Press has or will ever be discarded because of the owner's inability to obtain some needed part, or because the maker has gone out of business.

In our Engineering Department we have experienced and skilled engineers and draftsmen, and we are in position to furnish our customers with plans and specifications for the construction of brick plants.

In connection with our works we have a thoroughly equipped Testing Department, with ample facilities for making practical tests of shales and clays, for brickmaking by the semi-dry clay process.

We also have a staff of competent erecting men, who are practical brickmakers and burners, whom we send all over the world to supervise the erection of brick plants, installation of machinery and the making and burning of brick, if desired.

Six-Mold Boyd Brick Press Special



The Boyd Brick Press

"Built up to a standard—not down to a price."

THE Boyd Brick Press has great simplicity of design, enormous strength and great durability; it is very accessible and all adjustments are convenient. It is universal in its operation and adaptability, to work the various kinds of clays and shales used in the manufacture of high-grade face and ornamental brick, common building brick and fire brick. It operates quietly and smoothly, and is adaptable to a wide range in shape and character of product. It has no complicated parts or motions, the construction is ingenious, embodying the most perfect application of scientific and mechanical principles known to brick-pressing machines.

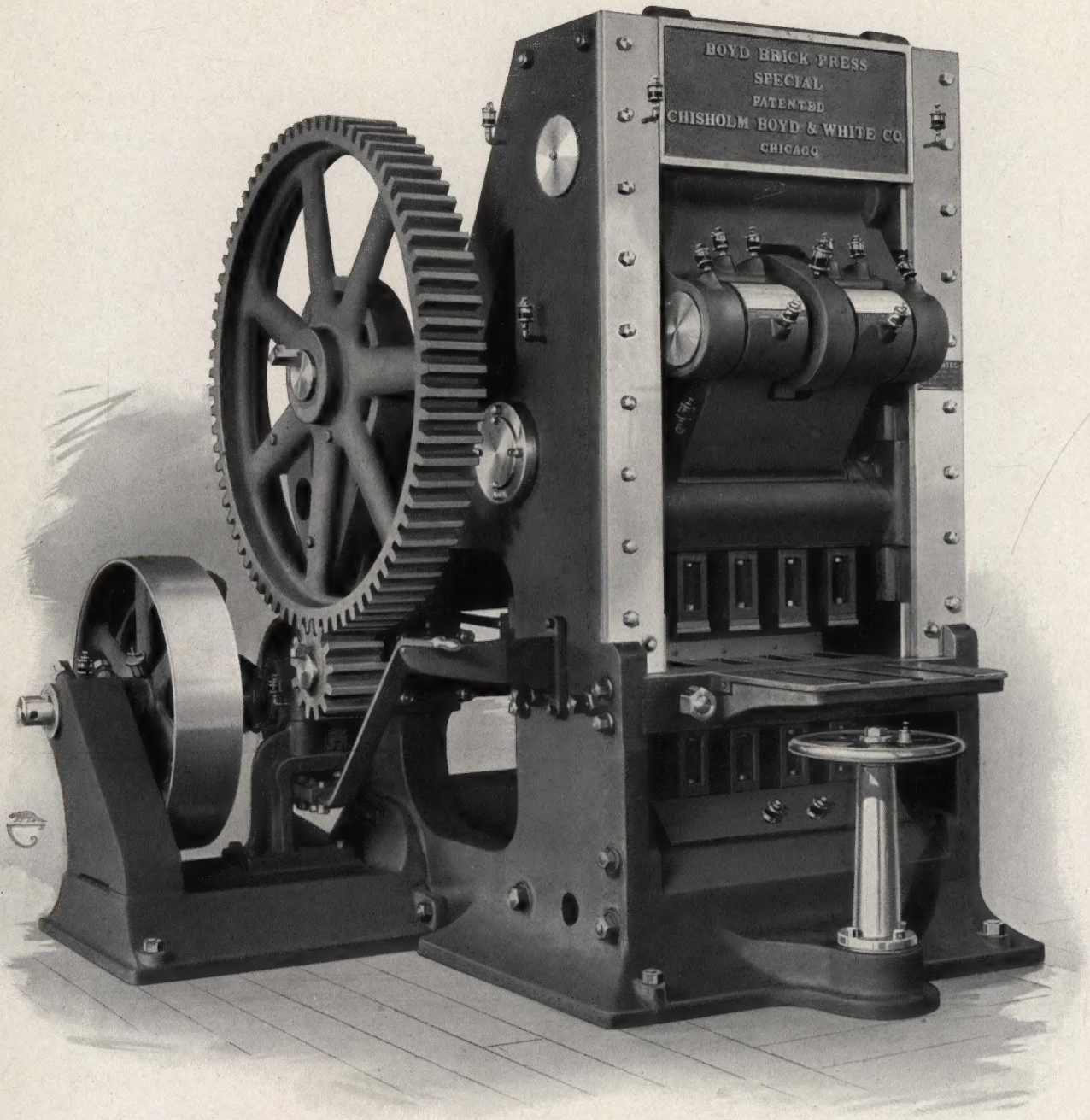
The Boyd Brick Press is the only machine having a *"Balanced-Pressure"* device. With this improvement the pressure is automatically equalized on both sides of the brick, so that they are of uniform density through from top to bottom, and absolutely free from granulated surfaces, soft centers and with good hard corners and edges. This is an entirely new feature in brick-pressing machines and is essential to an up-to-date brick press.

The adjusting device, for regulating the quantity of clay charged into the molds and pressure on the brick, is independent of, and entirely free from the lower crosshead. This adjustment is made at any part of the cycle without raising or lowering the entire pressing mechanism, a feature found only in the Boyd Press.

In the operation of the Boyd Press the motions of the parts are timed so as to give slow, steady pressure of long duration on the brick. This motion gives ample time to expel the air from the clay and firmly bond it into brick form. The pressing time factor is 50 per cent of the cycle of the machine; the other 50 per cent of the cycle is required for charging the molds, ejecting and delivering the brick.

The lower die plates remain up, flush with the top surface of the mold box until the charger has passed entirely over them. This insures perfect delivery of the finished brick onto the front apron of the press and also uniform filling of the molds.

All working parts are above the mold box and clay line, and all bearings are dust-proof and provided with oil and grease cups, for proper lubrication.



FOUR MOLD BOYD BRICK PRESS SPECIAL
(Built for Heavy Duty)

The Boyd Brick Press is built in three sizes—Six Mold, Four Mold, and Two Mold. On the following pages will be found a brief but accurate description of design, construction and operation, also their dimensions and capacities.

The main frames are double-plate construction reinforced with heavy ribs, and are joined by heavy tongued and grooved connecting pieces, which are securely fastened with large turned-steel, tight-fitting bolts and dowels. It will be readily observed that with this construction the machine is self-contained. The entire bottom surface is planed smooth, so that the whole machine has a perfect bearing on the foundation.

The vertical guides for the pressing mechanism have large bearing surfaces, and are provided with adjustable gibs. All bearings are exceptionally long, babbitt-lined and fitted with adjustable caps, and are bored with a special boring mill to insure accurate fit and perfect alignment of the shafts working in them. The gearing is well proportioned and of extra heavy design.

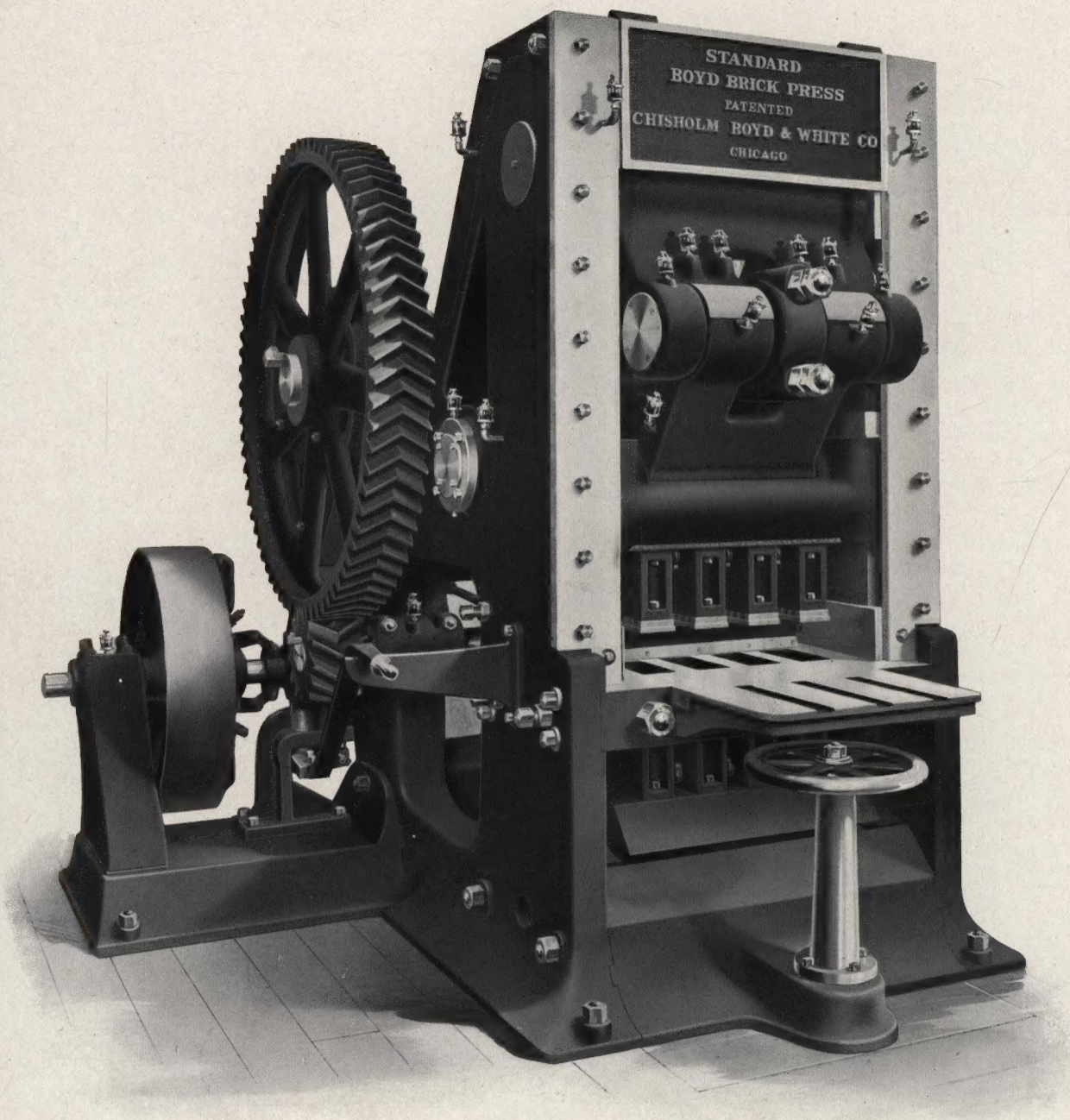
The pressing mechanism is of massive design throughout, and is the best possible form of construction. It consists of steel sidebars, toggles and shafts, upper and lower crossheads and plungers. These parts receive the entire stress for pressing the brick; no stress whatever by reason of pressure is placed upon the frames, these acting only as guides for the pressing mechanism.

The sidebars are made of high-carbon hammered steel, of great tensile strength, and are securely fastened to the lower crosshead by mortise joints. The lower crosshead is made of steel, is very broad and deep, and is fitted with a heavy saddle guided thereon. The upper crosshead has a large secondary toggle bearing, and is provided with adjustable vertical guides having large bearing surfaces.

The toggles are of heavy design, provided with secondary bearings, and connected by large shafts made of hammered steel. Thus it will be seen that the toggle bearings of the pressing mechanism are of great area, strength and durability.

The mold box, upper and lower plungers, charger, and front and back aprons, are all steam-heated to prevent the clay from adhering to these parts. The plungers are made separate and are easily adjusted or removed. The upper plungers are arranged with a quick and positive adjustment for changing the thickness of the brick.

The lifting mechanism, or parts that lift the brick to the top of the mold box, consists of long steel beams which are operated direct from the main crankshaft. The mechanism is positive, powerful and durable. Its operation is smooth



STANDARD FOUR MOLD BOYD BRICK PRESS

and noiseless, without jar or shock. No buffers, air cushions or other uncertain and unmechanical devices are employed, and it cannot get out of order.

The main crankshaft is of large diameter and is made of a superior grade of steel. It rotates in two massive babbitt-lined bearings. By its rotation, motion is imparted alternately to the pressing and lifting mechanisms, also to the charger, thus eliminating entirely any complicated or separate machinery, or parts for filling the molds and lifting the brick out.

The charger operates on a large, flat bearing surface. It has a long, easy stroke. It is easily and quickly removed.

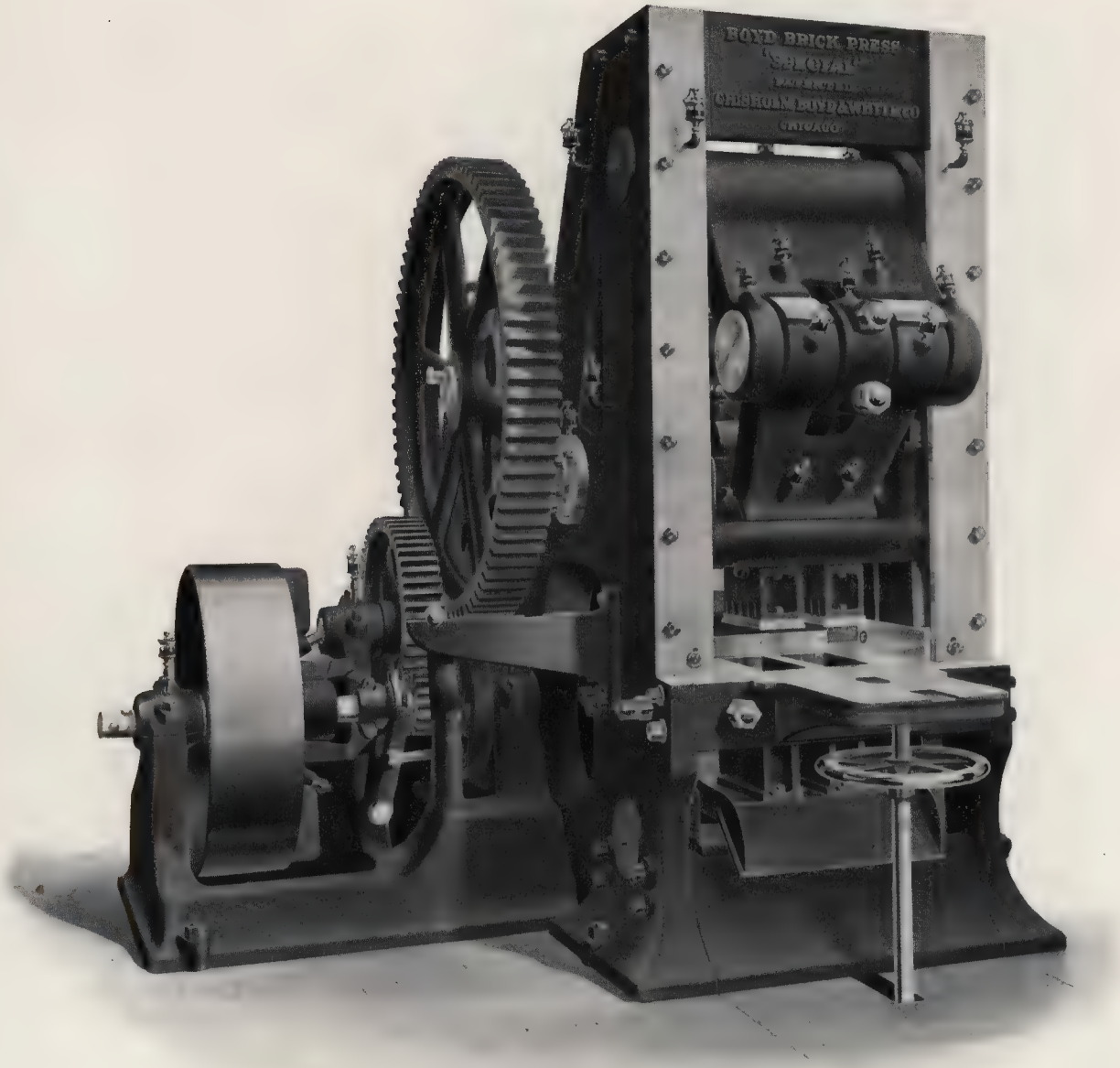
The lower plungers are guided independently of the molds by a saddle on the lower crosshead. This feature is a decided improvement and effects a great saving of mold liners and die plates.

The mold box, consisting of only four pieces, is of heavy design and is rigidly locked between the main frames. To change the mold liners it is not necessary to remove the mold box, or any part of it from the press, it being only necessary to loosen two bolts. It is so constructed that the changing of mold liners is quickly and easily accomplished. No wedges, no sulphur, no lead, no skeleton mold box, or other unmechanical devices are employed in its construction, or for holding the mold liners in place.

The friction clutch pulley is devoid of complications, is strong and durable, has few working parts and is easily adjusted. It is provided with an ingeniously designed starting lever, by which the operator, with one motion, disengages the friction clutch and at the same time applies a powerful brake to the gearing, so that the press is instantly stopped at any part of the stroke; and by a reverse motion the brake is released and the clutch engaged. This feature is of great convenience, for the operator has the machine under absolute control at all times.

In general, the materials, workmanship and construction throughout are unsurpassed. No rough, cheap work or materials of any kind are employed; no holes cored by the foundry to save machine work; no rough, poor-fitting bolts or screws are used. Every bolt hole is drilled to gauge and fitted with turned-steel, tight-fitting bolts. This careful construction throughout insures great solidity, strength and durability. The Boyd Brick Press is in a class by itself.

A complete set of special wrenches and other necessary tools are supplied with every press. All Boyd Brick Presses are adjusted, operated under belt, and thoroughly tested, making brick before shipment, and are fully guaranteed.



TWO MOLD BOYD BRICK PRESS SPECIAL

Dimensions and Capacities

Six Mold Boyd Brick Press Special

[See Page 6]

Floor space, 9′ 3″ x 10′ 8″. Height, 9′. Weight, 45,000 pounds. Friction clutch pulley, 36″ diameter, 12″ face; speed, 200 revolutions per minute. 15 H. P. required to operate. Capacity, 3,000 brick per hour.

Four Mold Boyd Brick Press Special

[See Page 8]

Floor space, 8′ x 8′ 8″. Height, 8′ 7″. Weight, 27,500 pounds. Friction clutch pulley, 36″ diameter, 8″ face; speed, 200 revolutions per minute. 10 H. P. required to operate. Capacity, 2,000 brick per hour.

Standard Four Mold Boyd Brick Press

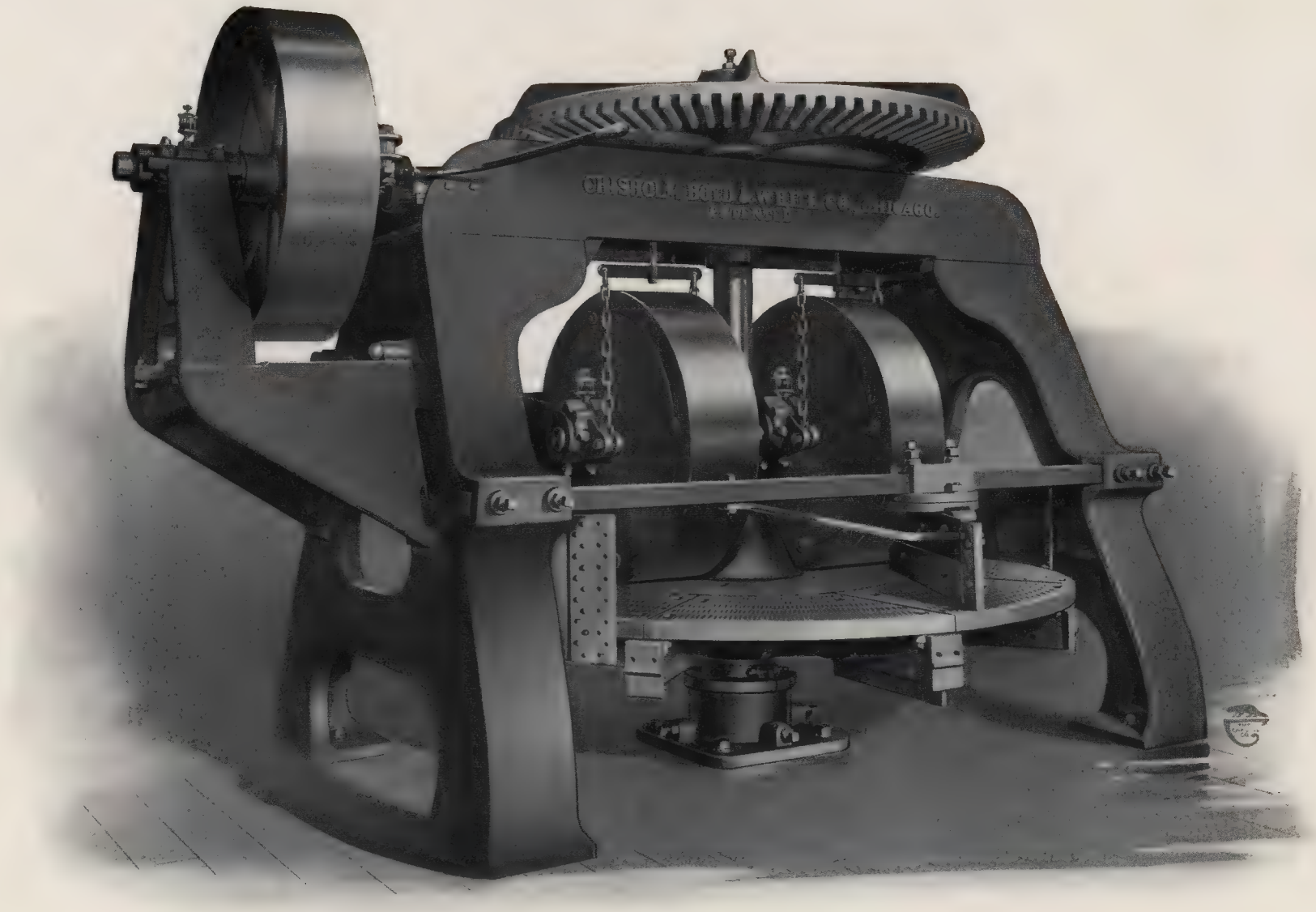
[See Page 10]

Floor space, 8′ x 9′. Height, 8′ 7″. Weight, 30,000 pounds. Friction clutch pulley, 36″ diameter, 8″ face; speed, 200 revolutions per minute. 10 H. P. required to operate. Capacity, 2,000 brick per hour.

Two Mold Boyd Brick Press Special

[See Page 12]

Floor space, 6′ 2″ x 6′ 6″. Height, 7′. Weight, 14,000 pounds. Friction clutch pulley, 30″ diameter, 6″ face; speed, 200 revolutions per minute. 5 H. P. required to operate. Capacity, 1,000 brick per hour.



THE BOYD DRY PAN

The Standard Boyd Nine Foot Dry Pan

THE engraving on opposite page illustrates our Standard Boyd Dry Pan. This machine occupies a floor space of 9′ x 12′ 8″ and is 12′ high. Weight, 32,000 pounds. Screening surface, 47 square feet. Friction clutch pulley, 48″ diameter, 12″ face; speed, 150 revolutions per minute.

The main frames are massive design (channel section). The cross beam is 14″ deep and 24″ broad (channel section).

The upright shaft is 6″ diameter, made of hammered steel, supported in a long, babbitt-lined bearing, in the cross beam. The gear is 6′ diameter, 7½″ face, and is adjustable vertically on the shaft.

The friction clutch pulley is bronze bushed, and of the same type as used on the Boyd Brick Press.

The step bearing is of the universal submerged-in-oil type, made of bronze, 10″ in diameter, having 78 square inches of wearing surface.

The Pan center is double plate, car wheel construction, having a hub 24″ deep, and the grinding plates are 2″ thick, made of hard white iron.

The mullers are fitted with tires 4″ thick, made of hard white iron, and are 48″ diameter, 10″ face. They are suspended free of the pan bottom, and held by heavy yokes independent of each other. The shafts are keyed to the mullers, and revolve in babbitt-lined bearings in the yokes, which is a decided improvement over the old method of the mullers revolving on the shafts. All parts, including the step bearing, are very accessible.

The Boyd Heavy Duty Nine Foot Dry Pan

This Heavy Duty Dry Pan was designed and is adapted for grinding hard shales, slates, flint fire clays, and other hard materials. It is of the same general design throughout as the Standard Pan and occupies the same floor space. Weight, 40,000 pounds. Friction clutch pulley, 48″ diameter, 12″ face; speed, 150 revolutions per minute. It has 47 square feet of screening surface.

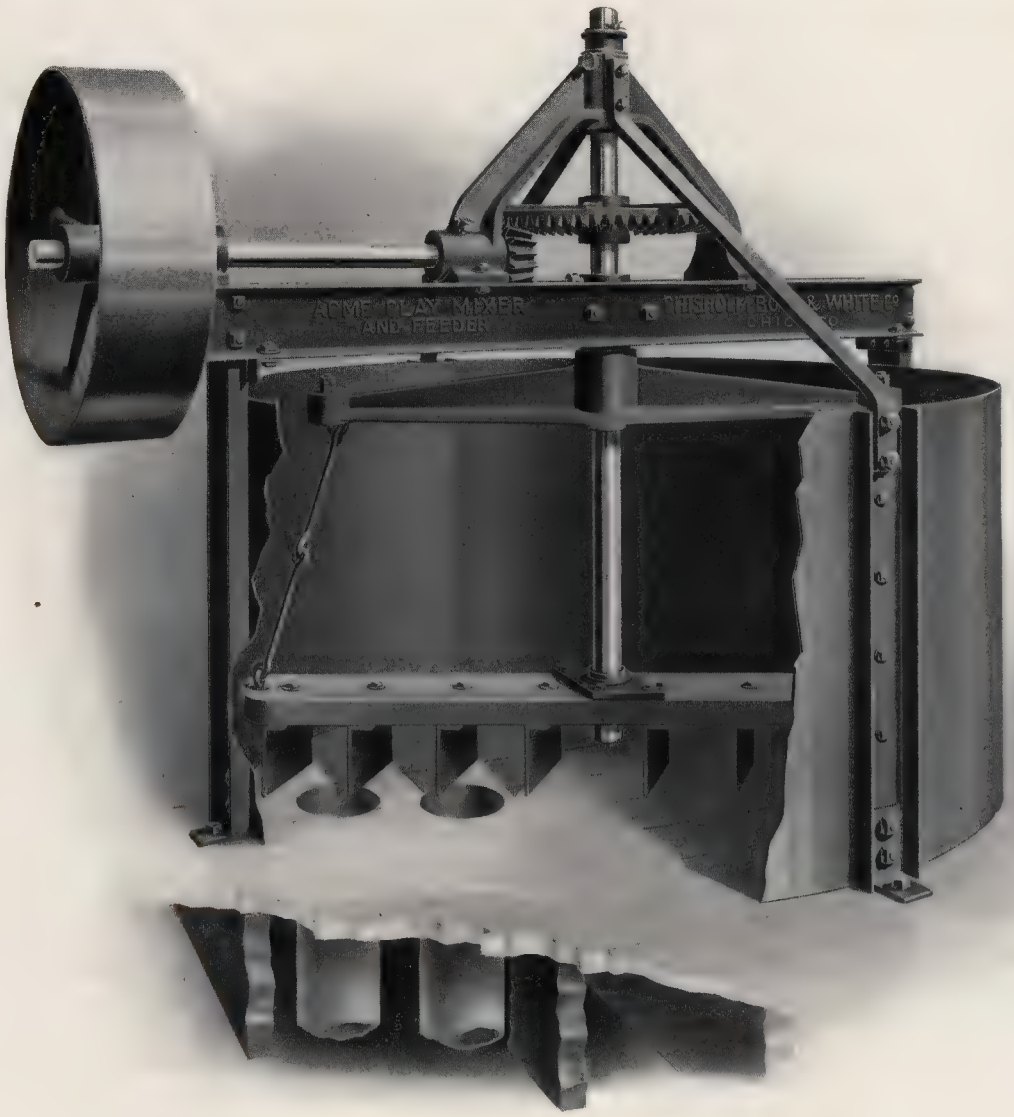
The upright shaft of this Pan is 7″ diameter, made of hammered steel, and the gear is 7′ diameter, 8″ face.

The bronze step bearing is 12″ diameter, having 114 square inches of wearing surface, submerged in oil, and adjustable on a heavy cast iron base.

The Pan center is also of car wheel construction, having a hub 26″ deep, and the grinding plates are 3″ thick.

The mullers are 48″ diameter, 12″ face, suspended in yokes independent of each other. The shafts are keyed to the mullers, and revolve in babbitt-lined bearings in the yokes.

Workmanship, materials and construction of these Pans are of the highest class and up to Boyd quality, and are fully guaranteed.



ACME CLAY MIXER

THE Acme Clay Mixer and Feeder is built entirely of iron and steel. It is 6′ in diameter and the curb is 36″ high. Pulley is 30″ diameter, 8″ face; speed, 60 revolutions per minute.

The vertical shaft carrying the plow beam is supported by a double bearing on top of the machine, and above the clay line. By this construction, the troublesome bottom bearing generally used in mixers is eliminated.

With this machine the clay is thoroughly mixed, and a uniform and steady feed is supplied to the press, thus increasing the capacity, and improving the quality of the brick.

Improved All-Steel Dust-Proof Elevator Boot

THIS cut illustrates our All-Steel Elevator Boot, which is provided with slides over the shaft openings on each side, making it dust-proof. These slides are automatically adjustable with the take-up boxes, which have 18″ adjustment.

The bearings, being entirely outside of the boot, are protected from clay and dust by the slides. It is provided on one end with a convenient door for cleaning-out purposes, and is very accessible. Can be furnished in any desired size.

A MODERN BRICK PLANT

Economy

ECONOMY in handling the raw material, and finished product should be carefully considered when designing and locating a brick plant. It should be compact, convenient in arrangement, and not encumbered with unnecessary or useless machinery or appliances. If improperly designed, high cost of production is the result. If any of the machines are of faulty construction, or the plant in any way complicated, serious and costly delays and shut-downs are the result. Therefore the selection of each machine, the general design, and arrangement of the whole plant are of utmost importance.

To try to economize in first cost of machinery, for a brick manufacturing plant is *not economy* in the end, for it should be considered, that the first cost of the machinery equipment will represent but a small portion of the total investment. The Brick Press and Dry Pan, are the two most important machines in such a plant, for upon their efficient and continuous operation depends the success of the enterprise.

The cost of freight and installation for cheap and poorly constructed machinery, will amount to as much as for the best. The cost of power and labor required, to operate such machinery is never any less. Loss of time and product by reason of break-downs, and delays waiting for repairs, (if such repairs can be obtained at all) must be charged to average cost of production. Meantime, overhead and fixed expenses remain the same, which greatly increases the cost of manufacture because of reduced capacity.

For these reasons the only sure way to economize, is to select and purchase the very best machinery, even though first cost is a little more, for it will prove by far the most economical in the end.

A cheap machine is never paid for. Every dollar expended for repairs on such machines must be added to original cost. It is an endless system of installments. These installments, including the original investment, soon exceed the first cost of the Boyd Brick Press, Boyd Dry Pan and auxiliary equipment.

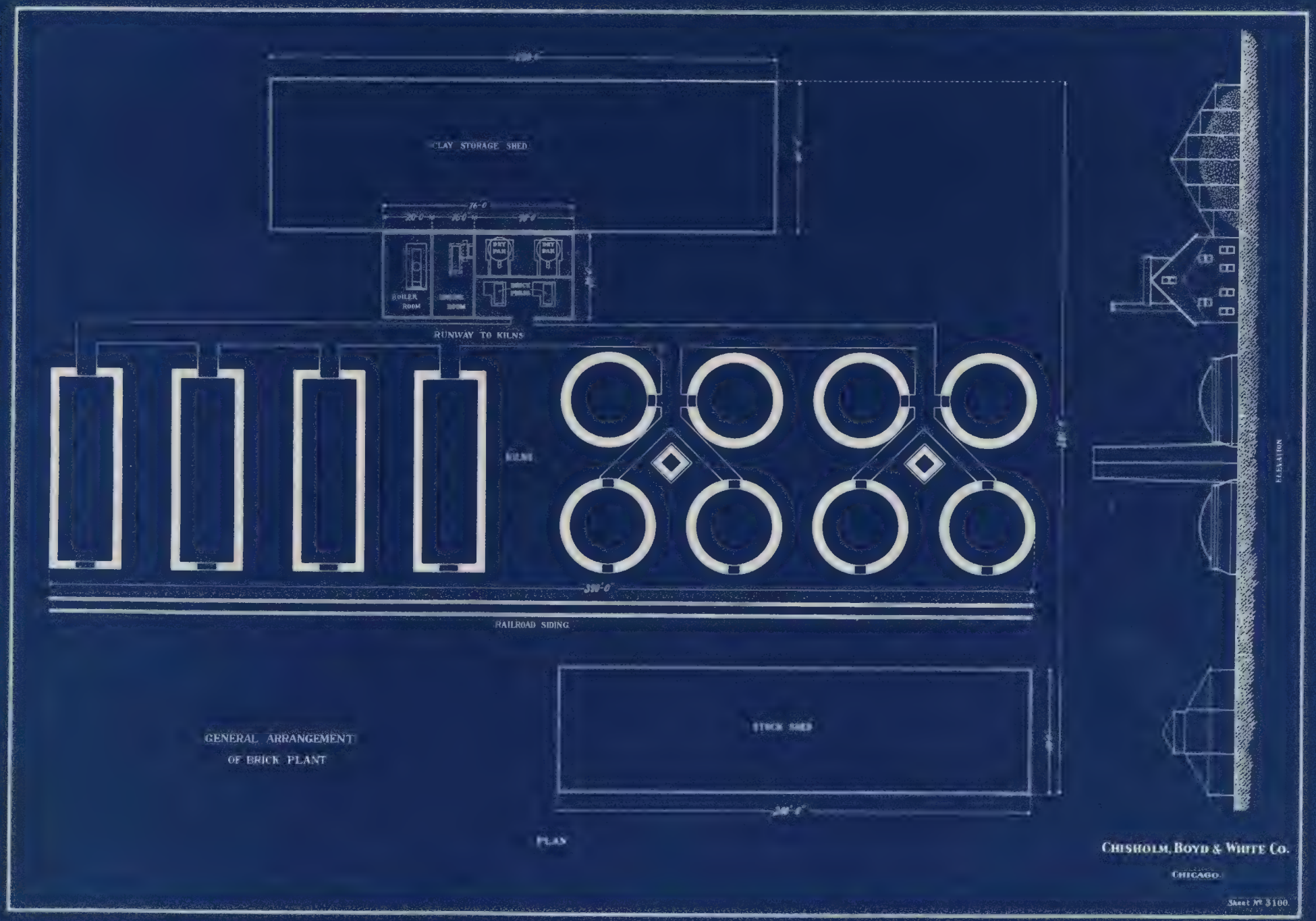
The blue print on page 21, (sheet No. 3100) illustrates a brick plant which occupies, with kilns and storage sheds, a total space of 380 x 390 feet. Such a plant will produce 40,000 to 60,000 bricks per day, according to the size or

capacity of the presses installed. It will be observed that provision is made, and space allowed to extend the building, for the installation of additional machinery, and that the clay storage shed is in the rear of and adjoins the machine building, convenient to the grinding and mixing machinery; also that the brick when made are always moving toward the railroad siding, or stock sheds without unnecessary and costly handling. This plan can be modified or changed to suit various conditions and requirements.

The drawing on page 22, (sheet No. 3101) shows the ground or first floor plan of the machinery building, for two four-mold presses with outfit of grinding and mixing machinery, including power plant.

The drawing on page 23, (sheet No. 3102) shows in detail the general arrangement of the machinery, from which it will be seen that the clay or shale, is fed into a dry pan or other suitable crusher to be ground. It is then elevated and screened. The fine screened clay descends by gravity to the mixer above the press, while the tailings return to the crusher to be reground. From the mixer, the clay passes through spouts to the press hopper, and the molded green bricks are delivered automatically on the front apron, from which they are taken on trucks direct to the kiln and set for burning. This avoids the expense of repressing, artificial drying, or other intermediate and unnecessary handling.

To obtain the best results, surface or field clays should be thoroughly seasoned before being made into brick. The usual method of handling such material is by plowing the clay beds or fields to a depth of 3 or 4 inches. The plowed clay is allowed to remain exposed to the sun and wind, until it is partially dry and contains from 8 to 15 per cent of moisture. It is then stored in a shed, adjacent to the machinery building, and allowed to remain there until it goes through the curing process, and has become uniform and mellow. When in this condition it is easily pulverized and screened. Clays treated in this manner will make better brick than if worked direct. Shales and hard clays are generally used direct from the beds or mines, although such materials are improved, and will make better brick if allowed to weather and disintegrate by exposure to the atmosphere.

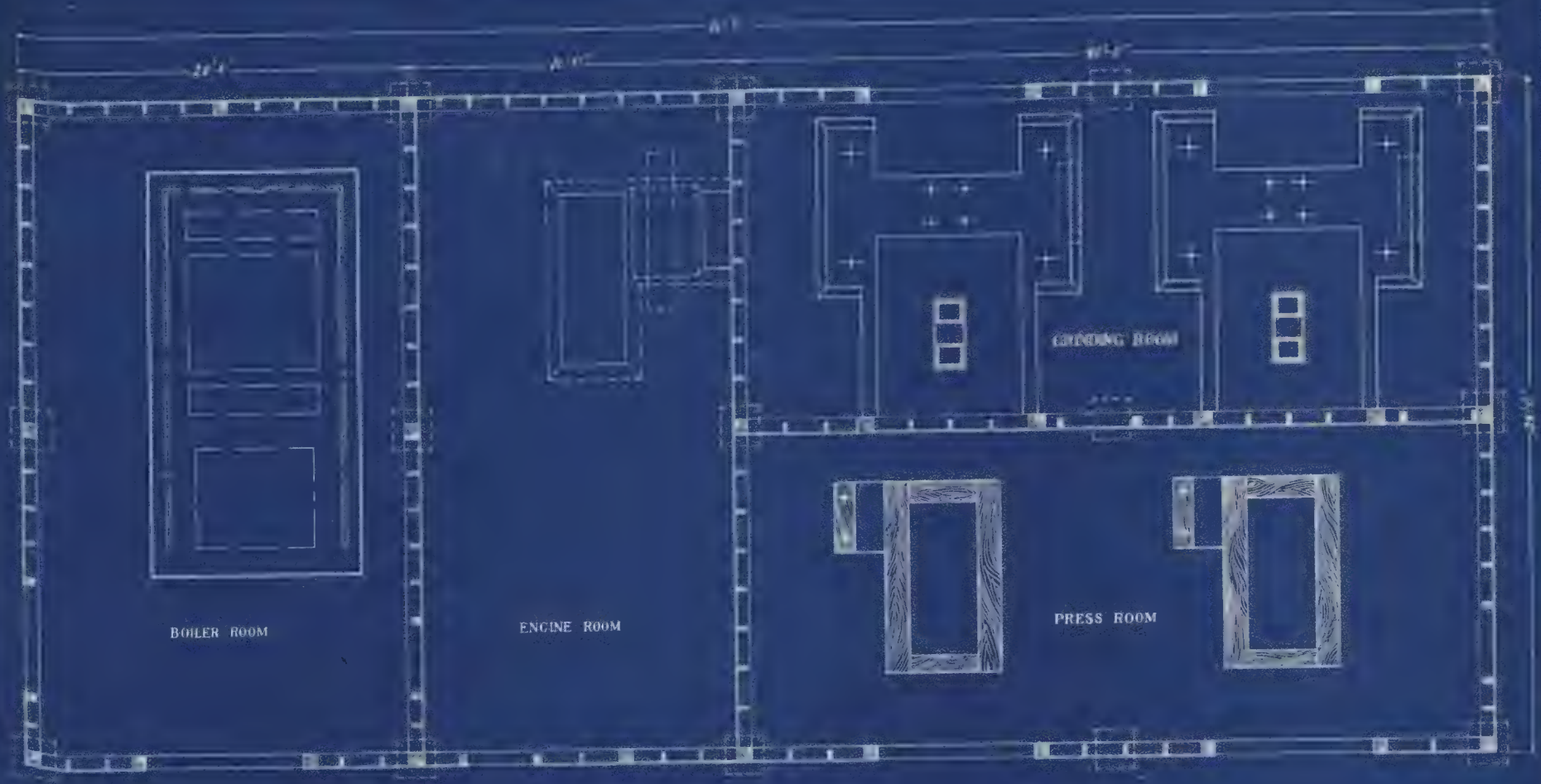


GENERAL ARRANGEMENT
OF BRICK PLANT

PLAN

CHISHOLM, BOYD & WHITE CO.
CHICAGO.

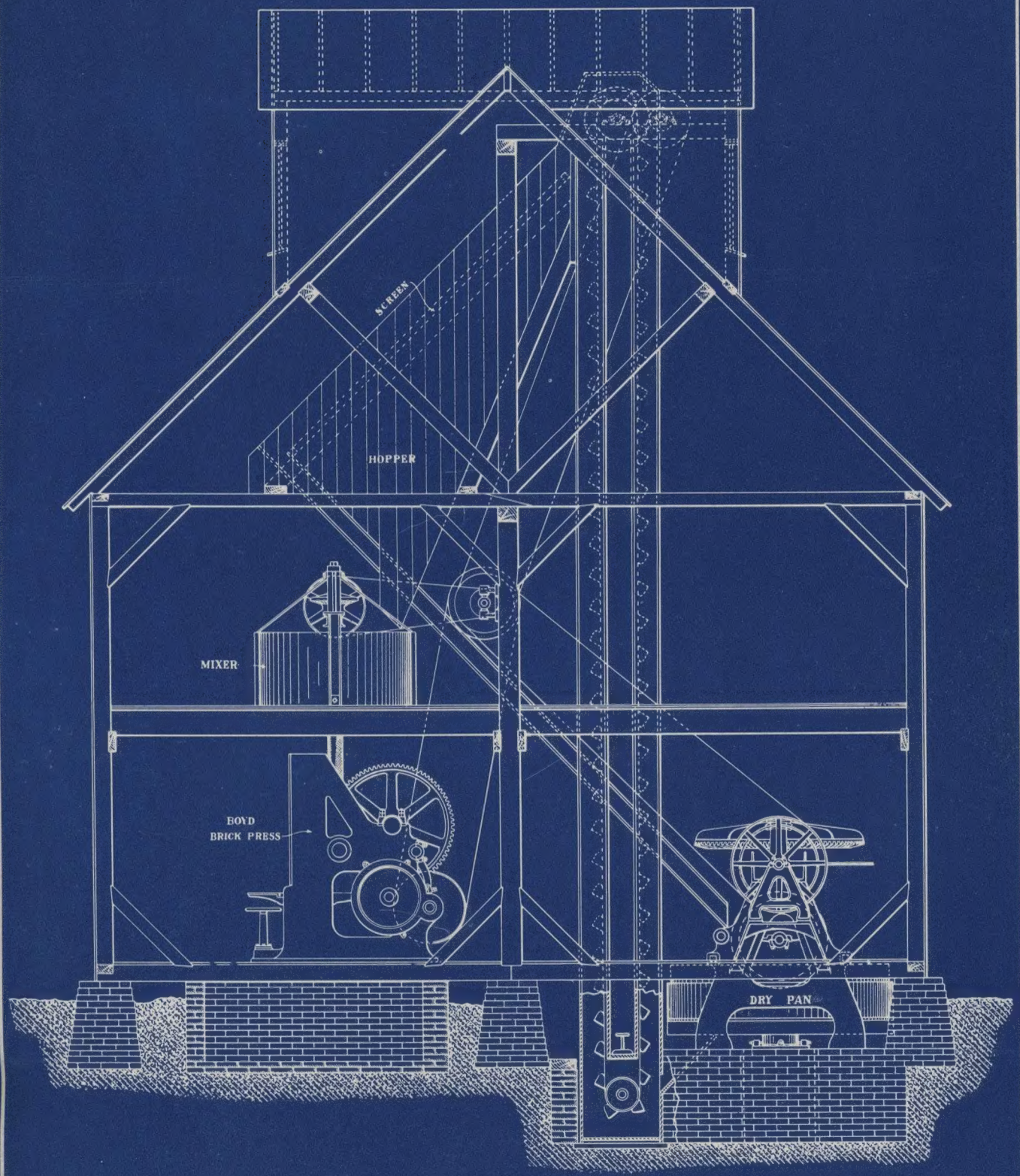
Sheet № 3100



GROUND PLAN OF MACHINERY BUILDING & POWER HOUSE.

CHISHOLM, BOYD & WHITE CO.
CHICAGO

Sheet № 3101.



ELEVATION

CHISHOLM, BOYD & WHITE CO.

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Sheet No. 3102

Cargill
GRAND RAPIDS